NÜVE SANAYİ MALZEMELERİ İMALAT VE TİCARET A.Ş.

NF 1200 / 1200 R

MULTI-PURPOSE BENCH TOP CENTRIFUGES

USER'S MANUAL

CE

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SECTION 1

INTRODUCTION

1.1 USE AND FUNCTION

The NF 1200 / NF 1200 R centrifuges are designed to separate liquids of different densities by applying centrifugal force. Different types of rotors, which are swing-out and angle rotors, can be fitted to the centrifuges.

The microprocessor control system of the centrifuges enables the user to observe and to control the speed (RPM or RCF), the acceleration and braking rates, run time, program number and temperature of the bowl for NF 1200 R. The microprocessor control system also displays the RPM or RCF value during the run.

The ventilation system of the NF 1200 limits temperature in the bowl between the ambient temperature + 3 °C and ambient temperature + 12 °C depending on the rotor type. The NF 1200 R is equipped with a cooling system which provides to operate between -9 °C and + 40 ° C.

It ensures safe processes by means of the locking system which does not allow the centrifuge to operate if the lid is open and which does not allow the rotor to spin if the lid is not closed.

The lid locking system which does not allow the centrifuge to operate if the lid is open, which also does not allow the lid to be opened while the rotor is spinning and the possibility to open the lid by pushing only one key when the program ends, provide safe and easy working conditions. There are audible and visible alarms to inform the operator when the lid is open, when the program ends and when any error conditions occur. In case of a power failure, the lid could be opened manually by using a manual lid opening tool

The NF series centrifuges are manufactured according to the following standards, EN 61010-1, EN 61010-2-020, EN 61000-6-3.

SECTION 2

TECHNICAL SPECIFICATIONS

2.1 TECHNICAL SPECIFICATIONS TABLE

	NF 1200	NF 1200 R
Max Speed	RA 280 rotor: 4100 rpm, MP 200 rotor: 4100 rpm, RS 600 rotor: 9000 rpm, RS 100 rotor: 12000 rpm, RS24 rotor: 14000 rpm, RS 30 rotor: 13500 rpm	
Max. RCF	RA 280 rotor: 3082 x g, MP 200 rotor: 2349 x g, RS 600 rotor: 8965 x g, RS 100 rotor: 14167, RS24 rotor : 18405 x g, RS 30 rotor: 20170 x g	
Max. Capacity	RA 280 rotor: 4x280 ml, MP 200 rotor: 2x3 microtitre plates, RS 600 rotor: 6x100 ml, RS 100 rotor: 10x10 ml, RS 24 rotor: 24x1.5/2 ml, RS 30 rotor: 30x2 ml	
Control System	Microprocessor controlled	
Display	High Visibility Digital	
No. of Memories	10	
Speed Range	500-14000 rpm	
Speed Step	10 rpm	
Speed Accuracy	± 20 rpm	
Timer Range	01-99 min + Hold Position	
Timer Step	1 min	
Acceleration Rate	0: Slowest 9: Fastest	
Braking Rate	0: Slowest 9: Fastest	
Power supply	230 V, 50 Hz	
Temp. range		-9° C / 40 ° C
Refrigerant Liquid		R134a
Temp. Accuracy		1°C
Temp. Performance	(at maximum speed) ambient temp+12°C	+4°C at max. speed
Max. Power	500 W	800 W
Ext. Dimension	455 x 545 x 400	770 x 540 x 400
Packing Dim.	600 x 520 x 630	870 x 650 x 550
Net / Gross Weight	46 / 51 kg	75 / 80 kg

2.2 ACCESSORIES FOR NF 1200/1200R

- **A 08 062** Puller for rotor removal
- **B 50 016** RA 280 swing- out rotor 4*280 ml , 4.100rpm , 3.082 x g
- **G 51 007** Set of 4 buckes for RA 280
- **G 51 036** Set of 4 buckets with sealing cap
- **G 51 008** Set of 4 insert 1x280 ml
- **G 51 009** Set of 4 insert 1x250 ml flat
- **G 51 010** Set of 4 inserts 1x200 ml flat
- **G 51 011** Set of 4 inserts 1x100 ml
- **G 51 012** Set of 4 inserts 2x50 ml conical
- **G 51 013** Set of 4 inserts 4x25 ml
- **G 51 014** Set of 4 inserts 2x15 ml conical

- **G 51 015** Set of 4 inserts 12x15 ml
- **G 51 016** Set of 4 inserts 12x5/7 ml
- **G 51 017** Set of 4 inserts 19x5 ml RIA
- **B 50 021** MP 200 microtitre rotor 4.100 rpm 2.349 xg
- **B 50 023** RS 600 Angle rotor 6x100 ml 9.000 rpm , 8.965 xg
- **G 51 018** Set of 6 adaptors 1x50 ml
- **G 51 019** Set of 6 adaptors 1x50 ml conical
- **G 51 020** Set of 6 adaptors 1x30/38 ml
- **G 51 021** Set of 6 adaptors 1x15 ml conical
- **B 50 022** RS 100 Angle rotor 10x10 ml 12.000 rpm ,14.167xg
- **G 51 022** Set of 6 adaptors 1x6 ml
- **G 51 023** Set of 6 adaptors 1x1.5/2 ml
- **B 50 014** RS 24 Angle rotor 24 x1,5/2 ml 14.000 rpm , 18.407xg
- **A 14 005** Adaptor 500/800 µl
- **A 14 006** Adaptor 200 µl PCR
- **A 14 007** Adaptor 250/400/700 µl

2.3 GENERAL PRESENTATION

Figure 1

Figure 2

1	LID	**7**	On / off switch
2	Lock pin	**8**	Bowl
3	Gas spring	**9**	Electrıcal cables inlet and fuses
4	Gasket	**10**	Manual LİD opening hole
5	Rotor	**11**	Cooling unit
6	Dısplay and conrol panel		

2.4 ROTOR SELECTION TABLE

SWING-OUT ROTORS AND ACCESSORIES

Rotor	Description	Capacity	Max.Tube Dia.(mm)	Radius (mm)	Max. Speed (rpm)	Max.RCF xg
RA280	Swing-out Rotor	4x280ml		164	4,100	3,082
	Set of 4 buckets	380 ml nominal	76			
	Set of 4 inserts	1x280ml	65			
	Set of 4 inserts	1x250ml flat	62			
	Set of 4 inserts	1x200ml flat	55			
	Set of 4 inserts	1x100ml	39			
	Set of 4 inserts	2x50ml conical	30			
	Set of 4 inserts	4x25ml	25			
	Set of 4 inserts	5x15ml conical	17			
	Set of 4 inserts	12x15ml	17			
	Set of 4 inserts	12x5/7ml	13.5			
	Set of 4 inserts	19x5ml RIA	13			
MP200	Microtitre Plate Rotor	2 x 3 microtitre plates		125	4,100	2,349

ANGLE ROTOR ACCESSORIES

Rotor	Description	Capacity	Max.Tube Dia(mm)	Max.Radius (mm)	Max.Speed (rpm)	Max RCFxg
RS600	Angle Rotor	6x100ml	38	99	9,000	8,965
	Set of 6 adaptors	1x50ml	30			
	Set of 6 adaptors	1x50 ml conical	30.5			
	Set of 6 adaptors	1x30/38ml	26			
	Set of 6 adaptors	1x15 ml conical	17			
RS100	Angle Rotor	10x10ml	16	88	12,000	14,167
	Set of 10 adaptors	1x6ml	13			
	Set of 10 adaptors	1x1.5/2ml	11			
RS24	Angle Rotor	24x1.5/2ml	11	84	14,000	18,405
	Adaptor	1x500/800µl	8			
	Adaptor	1x200 µl PCR	6.5			
	Adaptor	1x250/400/700 µl	6			
RS30	Angle Rotor	30x2ml	11	99	13.500	20.170
	Adaptor	1x500/800µl	8			
	Adaptor	1x200 µl PCR	6.5			
	Adaptor	1x250/400/700 µl	6			

2.5 PRECAUTIONS AND USAGE LIMITATIONS

- Do not use the device for any purpose other than the usage purpose.
- Prior to first use, the user's manual should be read and the device is only to be used by authorized and trained personnel. Only authorized technical personnel handle the product in case of any failure.
- The working bench should be durable to the device weight and vibration isolated.
- Ensure that the rotor is placed correctly prior to usage.
- According to the standard IEC 61010-2-020, anyone and any hazardous materials should not be in the 300 mm safety zone while centrifuge is running.
- Do not move the device while it is running.
- Do not open the lid while rotor is spinning.
- Apply the manual lid opening procedure in the case of power cut or in the case of any error.
- Use only the the spare parts, rotors and accessories which are supplied by NUVE.
- Load the rotor according to the explanations in the user's manual.
- Start the device after ensuring the rotor is loaded correctly.
- Do not use the centrifuge in areas which are in explosive danger.
- Do not centrifuge the explosive, flammable, radioactive, corrosive materials and the materials which may react with each other.
- The centrifuge and the rotor are not microbiologically leak-proof. Use tubes with leak-proof covers, if hazardous, toxic and pathogenic microorganisms are centrifuged.

- Do not use corrosive materials which may be harmful for the device integrity, rotor and accessories.
- Do not use rotors and accessories with corrosion and mechanical damages.
- Mains supply should be appropriate to power of the device and grounded.
- Use tubes whose sizes are suitable to the rotor and accessories.
- Tubes which are used in the centrifuge should not be deformed by the effect of the centrifuge force.
- Use glass tubes to balance, if glass tubes are used. Use plastics tubes to balance, if plastics tubes are used.
- Do not start the device unless tubes are in balance.
- Imbalance loading may cause mixing the samples, broken tubes, and damages on the rotor and motor shaft.

IF MENTIONED WARNINGS ARE NOT CONSIDERED, NÜVE WILL NOT BE RESPONSIBLE FROM THEIR RESULTS.

SECTION 3

SYMBOLS

	Symbol in the operating instructions: Attention, general hazard area. This symbol refers to safety relevant warnings and indicates possibly dangerous situations. The non-adherence to these warnings can lead to material damage and injury to personal.
	Symbol in the operating instructions: This symbol refers to important circumstances.

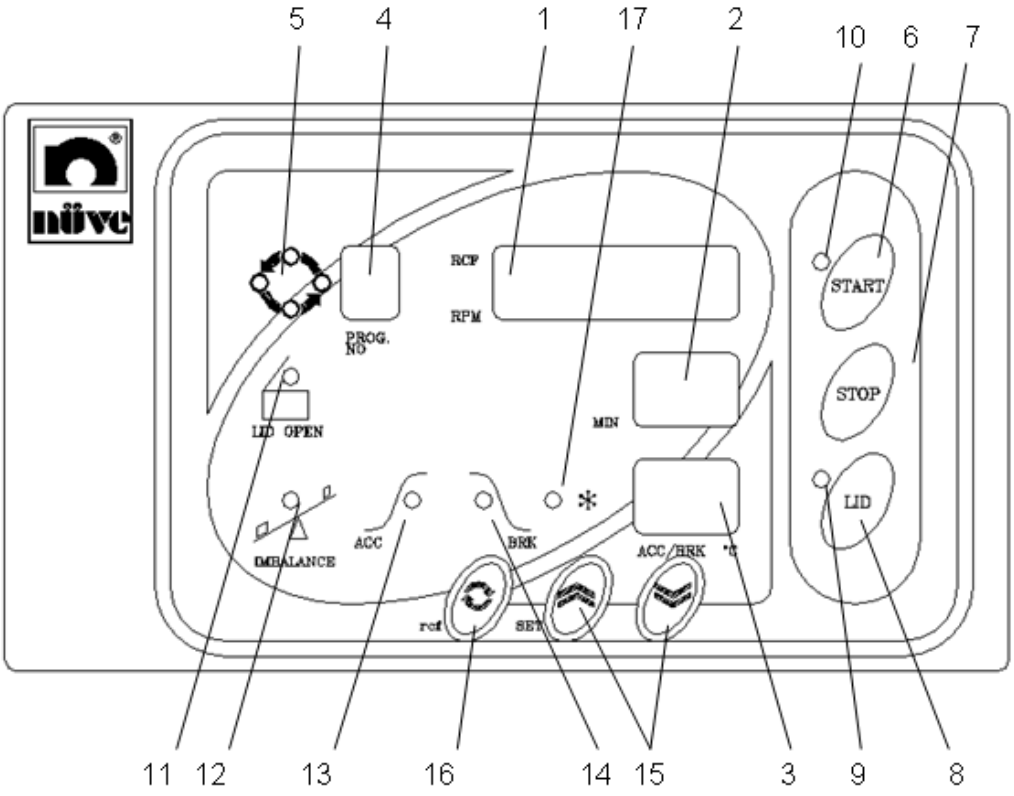
SECTION 4

OPERATING UNIT

4.1. OPERATING

- Open the lid and check that there is no sample in the instrument.
- Turn the centrifuges on by using On/Off switch.
- See that the display and control panel activates.
- Learn the functions of the control panel (See Part 4.2.1).
- Set the values and start the operation (See Part 4.3)

4.2. DISPLAYS AND CONTROL PANEL



Şekil 3

4.2.1. Introduction to Control Display Panel Components and Functions

01- Speed Display

- Display of speed (500-14.000 rpm) or display of RCF (0-18.405 x g) during the run and rotor type during programming.

02- Time Display

- Display of the run time from 1 min. to 99 min. and hold position (H).

03- Acceleration/Brake/Temperature Display

- Display of the acceleration and brake rates from 0 to 10, for NF 1200 R it also displays the bowl temperature during programming and the run.

04- Program No Display

- Display of the program number from 0 to 9.

05- Running indicator leds

- The 4 leds light up consecutively during the run to indicate the spinning of the rotor.

06- START key

- Starts the centrifugation run.

07-STOP key
- Stops the run by starting the braking phase manually.

08- LID key
- Opens the lid if the lid indicator lights up.

09- LID Indicator Led
- This led is on if the opening of the lid is possible.

10- START Indicator Led
- This led turns on as the start button is pushed and turns off as the “Lid Indicator”(9) turns on after the rotor has stopped spinning.

11-LID OPEN Indicator Led
- It turns on if the lid remains open or is not properly closed.

12- Imbalance Indicator Led
- It is activated if imbalance occurs. Brake is applied immediately.

13- Acceleration Indicator Led
- It turns on while the acceleration rate is being programmed and while the rotor is accelerating.

14- Braking Indicator Led
- This indicator turns on while the breaking rate is being programmed and while the rotor is breaking.

15-Value Increase/Decrease Keys
- They increase or decrease values during programming stage and to select the program number during stand-by position. By pushing value increase key it is possible to see the set values during centrifugation.

16- Function key
- It is pushed to see the RPM or RCF value on the speed display during the run, to pass among the displays and to store the programmed values.

17- Cooling Indicator Led*
- It indicates that the cooling system functions. During programming, it indicates that the temperature value is being set on Acc/Br/Temp Display (3).

* It is not valid for NF 1200 model.

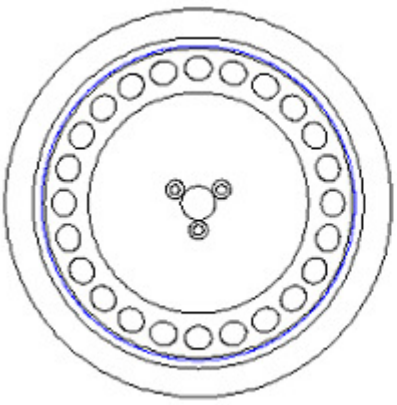
4.3. MAKING A NEW PROGRAM

Determine the rotor type, the speed and time, the acceleration and braking rates.

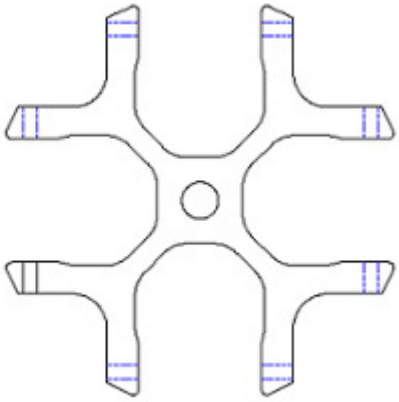
- Push the function key (16) once and see that the value on the program no display (4) flashes. Enter the program number by pushing the value increase and value decrease keys (15).

- Push the function key (16) again and see that the value on the speed display (1) flashes. Select the proper rotor type by pushing value increase and value decrease keys (15).

ROTOR TYPE	DISPLAY	MAXIMUM SPEED (RPM)	MAXIMUM SPEED (RCF)
RA 280 Swing Out	S out	4,100	3,082
MP 200 Swing Out	PLAtE	4,100	2,349
RS 600 Angle	6 50	9,000	8,965
RS 100 Angle	10 10	12,000	14,167
RS 24 Angle	24 1.5	14,000	18,406



Angle Rotor



Swing-out Rotor

NOTE : The correct rotor type should be selected in order to see the correct RCF values during the run.

- Push the function key (16) and see that the RPM or RCF option on the speed display (1) flashes. Choose the RPM or RCF option by pushing value increase and value decrease keys (15).

- Push the function key (16) and see that the value on the speed display (1) flashes. Enter the run speed or RCF by pushing value increase and value decrease keys (15).

- Push the function key (16) and see that the value on the time display (2) flashes. Enter the run time by pushing the value increase and decrease keys (16). (H means hold position)

- Push the function key (16) and see that the acceleration led turns on and the value on the temperature display (3) flashes. Choose the acceleration value among 0,1,2,3,4,5,6,7,8 or 9 by pushing the value increase and decrease keys (15).
  (0: slowest 10: fastest rates)

- Push the function key (16) and see that the break led turns on and the value on the acc/break/temperature display (3) flashes. Choose the break value among 0,1,2,3,4,5,6,7,8 or 9 by pushing value increase and decrease keys.(0: slowest 9: fastest rates)

- Push the function button (16) and see that the cooling indicator led (17) turns on and the value on the acc/break/temperature display (3) flashes. Enter the bowl temperature value. (This step is not valid for NF 800 model.)

- Push the function key (16), the entered values will be saved.

You may make 10 (0-9) different programs.

4.4. RUNNING THE PROGRAM

- Switch on the centrifuge; see that the on/off switch led turns on.
- See that the control panel activates.
- Load your samples to the rotor and close the lid.

You can run the centrifuge in two different ways,

- You can make a new program (see section 5.3)
- You can select a program from the memory

PRE-COOLING

While operating the NF 1200 R centrifuge at sub-ambient temperatures, in order to get the maximum performance, without loading the rotor run the centrifuge at 1.500 rpm, at a temperature which is 3° C lower than the required temperature and at hold position until you see that the temperature inside the bowl drops to the required temperature. Then, stop the centrifuge, load your samples and start centrifugation.

4.4.1. SELECTING THE MEMORIZED PROGRAM

Select the requested program number at stand-by position by pushing value increase and decrease keys. All values related to the selected program will be shown on the relevant displays. Check that all values are correct.

- Load the rotor with samples by paying attention to the dynamic and static balances.
- Close the lid, see that the lid open warning led (11) turns off.
- Push START key (6) and see that the start led (10) turns on.
- The rotor starts accelerating according to the set value and the acceleration led turns on. The set speed or RCF value is displayed during the set time duration. (RPM or RCF screen will appear in every 3 seconds). For the operations whose speeds are higher than 2.000 rpm, the rotor accelerates according to the set acceleration value up to 2.000 rpm and then continues accelerating with the highest acceleration value, 9 to reach the set speed. As the speed reaches the set value, "-" sign appears on the acc/brk/temp display (3). (The NF 800 R shows the bowl temperature on the acc/brk/temp display until the centrifugation ends)
- The elapsed time is counted down as the centrifugation starts.
- When the time display shows "00", the program ends, the breaking led turns on and the set break rate is shown at acc/brk/temp display (3). The rotor brakes with the highest break rate, 9 until it slows down to 2.000 rpm and continues braking according to the set braking value.
- The elapsed time until the rotor stops is counted and is shown at the time display. This is the time that passes until the rotor stops.
- When the speed display shows "0000", the start led (10) turns off, the "end" expression appears and the lid led (9) turns on. The user is warned by an intermittently sounding alarm.
- Push the LID button (8) to open the lid.

You may leave the centrifuge at stand-by position.

NOTE 1 : You may display the RPM or RCF value on the speed display during the run by pushing the function button.

NOTE 2 : You may see all set values during the run by pushing the value increase key.

NOTE 3 : At hold position, the rotor keeps spinning until the STOP key (7) is pushed. After the STOP has been pushed, the rotor brakes according to the set brake rate,

NOTE 4 : The centrifuge waits at the stand-by position with the program values of the last program.

NOTE 5 : Please open the lid after every operation, otherwise the centrifuge cannot be run again.

4.5. SAFETY INTERLOCK SYSTEM

The safety interlock system prevents opening of the lid when the rotor is spinning.
The centrifuge does not operate until the lid is closed and the lid remains locked until the rotor stops spinning. The “Lid Open” indicator turns on to warn the user if the lid is not closed properly.

NOTE: If power failure occurs, access to the samples is possible by opening the lid with a special tool. Please see the manual lid opening section (3.6.) for further information.

4.6. IMBALANCE DETECTION SYSTEM

- The imbalance detection system of the NF 1200 / NF 1200 R centrifuges operates electronically when an unacceptable imbalance occurs. In this case the brake is applied immediately.
- The “Err 1” imbalance error is displayed and the imbalance indicator turns on. The lid cannot be opened until the rotor stops spinning. The centrifuge can only be started after the lid has been opened and the rotor has been re-loaded correctly.
- To avoid facing imbalance problem, please make sure to insert the tubes correctly.

4.7. MANUAL LID OPENING

In case of power cut or any breakdown, the centrifuge can be opened manually to access the samples.

To open the lid manually:

- Switch off the instrument.
- Insert the manual lid opening tool into the hole on the left side of the instrument (see the general view drawing).
- Push the tool keeping it horizontal until the lid opens.

WARNING !!!

Before opening the lid manually, make sure that the rotor already stopped spinning. Upon opening the lid, lift it by hand and observe the rotor. If the rotor is still spinning, close the lid and wait approximately 10 minutes before repeating the operation. This operation must be carried by someone who is informed of the danger and of the precautions which must be undertaken.

SECTION 5

OPERATING PRINCIPLES

5.1. PREPARATION OF THE ROTOR TO RUN

- Before installation, check the rotor for corrosion and cleanliness.
- Chemical corrosion or mechanical corrosion may do severe damage to the rotor and the centrifuge. Particles which are stuck inside the inserts cause the breakage of tubes and lead to major imbalance please check to make sure that no particles are left on the rotor.
- The central hole of the rotor and the motor shaft should also be clean and dry before all centrifugal operations and they must be kept in that way all the time.

5.2. LOADING

The most important condition of an efficient centrifugation is to balance the tubes properly. Loading must be done by meeting the requisites of static and dynamic balance.

Static Balance: This balance states that diametrically oppositely replaced weights are almost the same. In application, the liquid level in the tubes should be at the same height to balance the load.

Dynamic Balance: This balance states that diametrically oppositely replaced center of the gravity of tubes are symmetrical with respect to spinning axis of the rotor.

- Although in hospitals the samples having almost the same densities are centrifuged, in industry, samples having different densities may be centrifuged. In this case, the dynamic balance becomes more important factor than the static balance is.

- If the number of tubes to be centrifuged is less than the capacity of the rotor, the tubes must be placed oppositely. If an odd number of tubes is centrifuged, a water filled tube at the same weight should be used for balancing.

Imbalance of the rotor may cause major damage to the rotor and centrifuge.

Never attempt to introduce liquids into the tube inserts.

Balance the rotor with glass tubes if you use glass tubes for centrifugation.
Balance the rotor with plastic tubes if you use plastic tubes for centrifugation.

Always use tubes which can withstand to the set speeds.

Examples of the proper and improper loading are shown below.

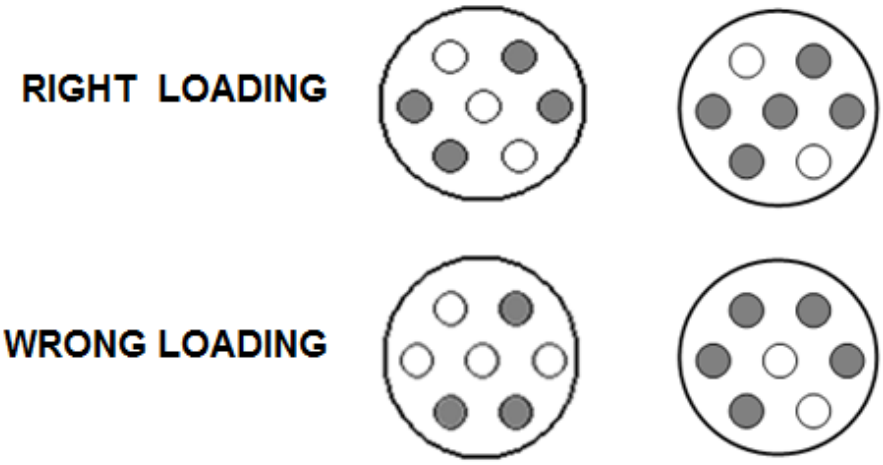


Figure 3

NOTE: Distribution of the load is more important than the load itself**.**

5.3. ROTOR INSTALLATION

- Put some light oil on the drive head to prevent sticking.
- Be careful that the rotor fits on the drive shaft (See Figure 4).
- Screw the shaft nut with socket wrench to the clockwise direction. Make sure that shaft nut is screwed tightly, but do not expose over-force to the socket wrench while screwing.
- For swing-out rotors, lubricate the pins where the buckets are hanged.
- Place the buckets to the rotor.
- Connect the centrifuge to the power supply.

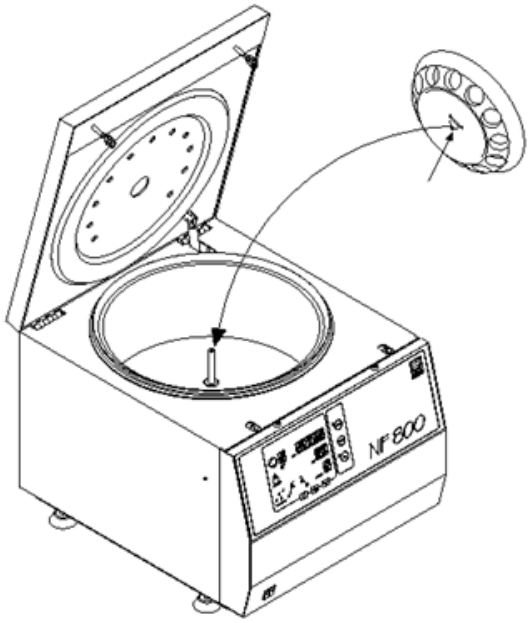


Figure 4

5.4. DRIVE SYSTEM

- The rotor is driven by a three phase asynchronous motor. The microprocessor control system assures the correct drive speed.
- The force applied to the rotor is directly related to the shape of the rotor, the swing-out rotor receives more load than the angle rotor does. Longer radius and more accessories increase the load of the rotor and decrease the spinning speed.
- The centrifuge does not allow the rotor to spin at a speed which it cannot resist mechanically.
- Please make that sure the correct type of rotor is selected during programming.

SECTION 6

CLEANING AND PERIODIC MAINTENANCE

6.1. PERIODIC MAINTENANCE

- Disconnect the power cable and after the maintenance check the presence of the mains grounding line.
- Rotors should be washed after every use, especially if a spillage has occurred, in warm water containing a few drops of liquid soap. (A mild washing liquid is ideal as a cleaner).
- Rotors and other accessorıes must be clean if any spillage or chemicals occur.
- You may use a nylon brush to clean the buckets and tube inserts of the rotor.
- **Do not use metal brushes.**
- Dry the rotor with a piece of soft absorber cloth. Please make sure that the buckets and inserts are well dried, you may use hair dryer.
- The buckets of the swing-out rotors should be greased frequently with the oil provided with the centrifuge. Please remove the light oil from the pins and put a small amount of fresh oil every time you grease. This will ensure free swinging of the buckets. Most of the imbalance problems are mostly raised by the users who do not clean and oil the pins.
- Please do not leave the rotor on a metal surface, particularly stainless steel as electrochemical reactions set off easily with the aluminum or magnesium in the rotor.
- Make sure that no deposit remains at the bottom of the bucket because the pressure of a flask or tube from above during centrifugation will certainly increase the chance of corrosion.

6.2. STERILIZATION

- Apply alcohol, for example %70 ethanol or isoprophanol, for 10 minutes against bacteria and viruses.
- The rotors and buckets may be autoclaved at 121℃ and under 215 kPa pressure for 20 minutes but please do not forget to remove all accessories.
- Do not use formaldehyde for the sterilization process.
- Phenol is a corrosive substance and should never be used.
- Glutaraldehyde is a toxic substance and increases the rate of fatty acid in the body.

6.3. CORROSION INFORMATION

- Nuve rotors which are made of aluminum are designed to spin at proper RCFs for many years. When used properly, their resistance to corrosion and their life span increases and the imbalance problems decrease.
- All accessories should be checked thoroughly and regularly as almost all laboratories already have the conditions which lead to corrosion easily.

6.3.1. Chemical Corrosion

This type of corrosion is caused by chemical reactions. The electrolide liquid on the surface of the material is the main cause of the chemical reaction. If that electrolide liquid is allowed to stay at the surface, corrosion occurs. First, discoloration appears and then the metal pittens. Aluminum easily reacts with the ionic solutions.

The other causes of corrosion are as follows,

- Chemical vapors in the laboratory environment which dissolve in the water on the rotor (in refrigerated centrifuges)
- Corrosive liquids which overflow from overfilled and unsealed tubes. (the liquids which spread out during centrifugation)
- Contaminated and non-cleaned buckets, tubes and bottles.

NOTE: If the centrifuged samples are corrosive, only rinsing with water is not sufficient. The residuals dissolve in the water and humidity on the rotor and in the buckets.

NOTE: Some particles may stick to the tubes, buckets and adapters. These particles crash and do harm to anodized surface during centrifugation and ease the occurrence of corrosion.

6.4. Stress Corrosion

This type of corrosion is caused by the force of the centrifugation of the corrosive chemical which is already in contact with the alloy. As the aluminum alloy contacts with the corrosive chemical, the stress corrosion starts. This type of corrosion is even more dangerous than the chemical corrosion as the effects of this corrosion are microscopic and very difficult to observe in the course of time.

The corrosive material is pushed against the aluminum alloy by the centrifugation “g” force during the centrifugation. This situation causes the stress corrosion to occur more quickly than the chemical corrosion does. Microscopic cracks occur under the force of the centrifugation.

Every centrifugation causes the aluminum rotor to be attacked by the chemical more and more and eventually micro-cracks decrease the resistance of the rotor against the centrifugation force. Fortunately, no crash occurs just after the first micro-cracks have appeared as the rotors are manufactured according to the high safety limits.

The corrosion of the small amount of corrosive materials does not result in severe cracks but weakens the mechanical resistance of the rotor in the course of time.

The rotor’s places, buckets, buckets’ edges and the base of the rotor should be checked regularly. If needed, they must not be used until a specialist has checked them thoroughly.

6.5. CLEANING

- Disconnect the centrifuge before cleaning.
- There is no need of daily cleaning unless a tube breakage occurs or any liquid spills.

6.6. ELECTRICITY

Centrifuged at high voltages are present behind the panels. These panels are electrically disconnecting Do not open the centrifuge

SECTION 7

DISPOSAL MANAGEMENT CONCEPT

The currently valid local regulations governing disposal must be observed. It is in the responsibility of the user to arrange proper disposal of the individual components.
Applicable local regulations for disposal have to be carefully observed.
The instruments and electronic accessories (without batteries, power packs etc.) must be disposed off according to the regulations for the disposal of electronic components.
Batteries, power packs and similar power source have to be dismounted from electric/electronic parts and disposed off in accordance with applicable local regulations.

SECTION 8

TROUBLESHOOTING

If the centrifuge fails to operate,

Check that,
- The on/off switch is on,
- The fuses are sound,
- The plug is not defective,
- The centrifuge is well connected to the supply,
- The electricity installation is not defective,
- Power is supplied.

In case of below written failures, related error codes are shown,

Err 2
- Motor overheat. Please switch off the centrifuge for at least 20 minutes

Err 3
- Speed failure. The optical sensor could have failed. Please observe whether the “running” indicator leds are on or not. If it is not on, the optical sensor is defective. If it is on, the motor could have failed. Contact to your service if either occurs.
- This error code occurs when the mains voltage drops below the lower limit.

Err 4
- Lid failure. This failure occurs when lid is opened during the centrifugation.

Err 5
- The temperature sensor endings are broken. This error code appears only on NF 1200R.

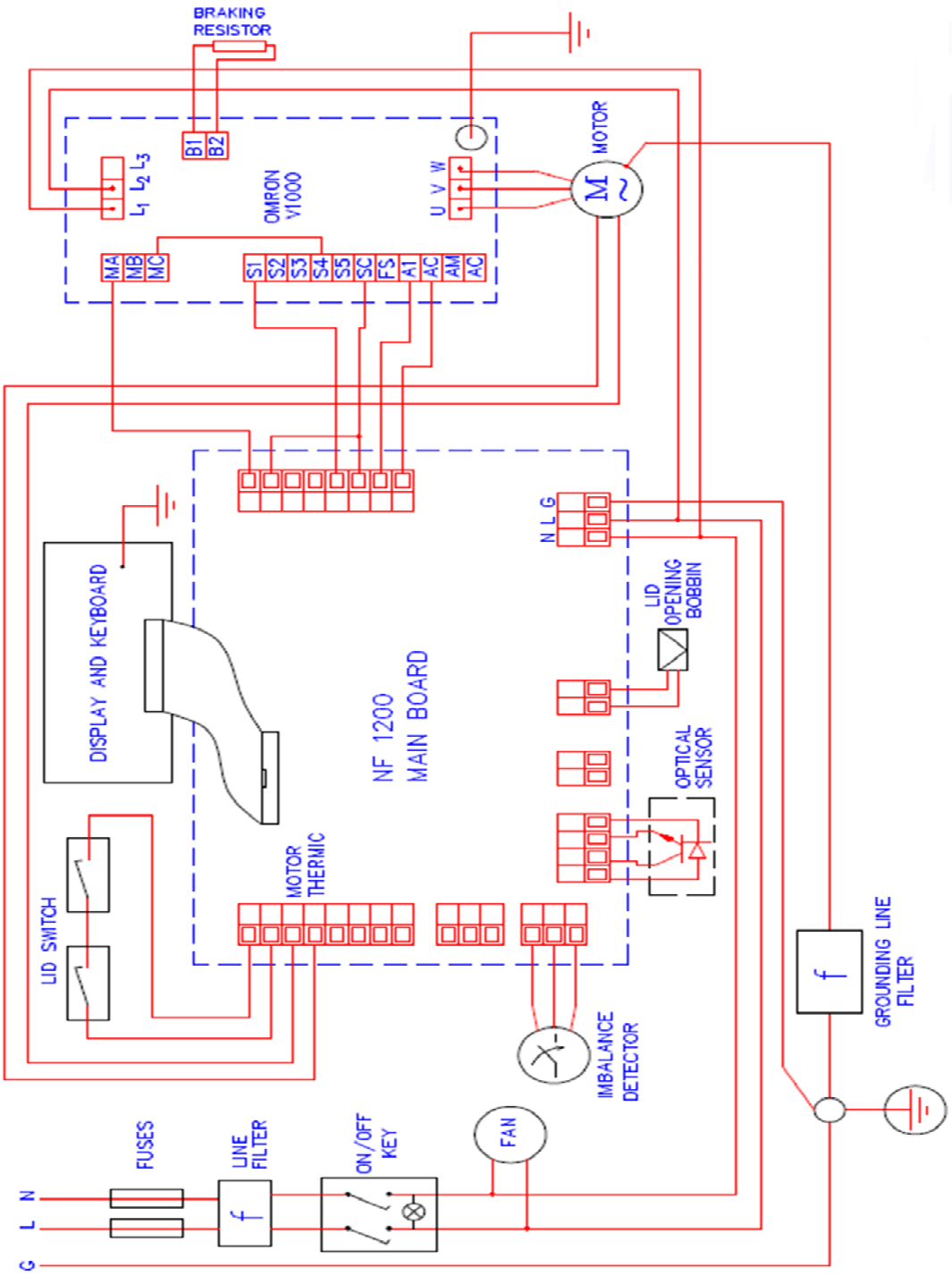
Err 6
- Motor failure. The motor driver unit (inverter) is defective. Switch off the centrifuge and switch on again after the motor has stopped. If you still see the error code, contact to the service.

PLEASE CONTACT TO AN AUTHORIZED NUVE AGENT TO SEEK TECHNICAL HELP IF AN ERROR OCCURS.

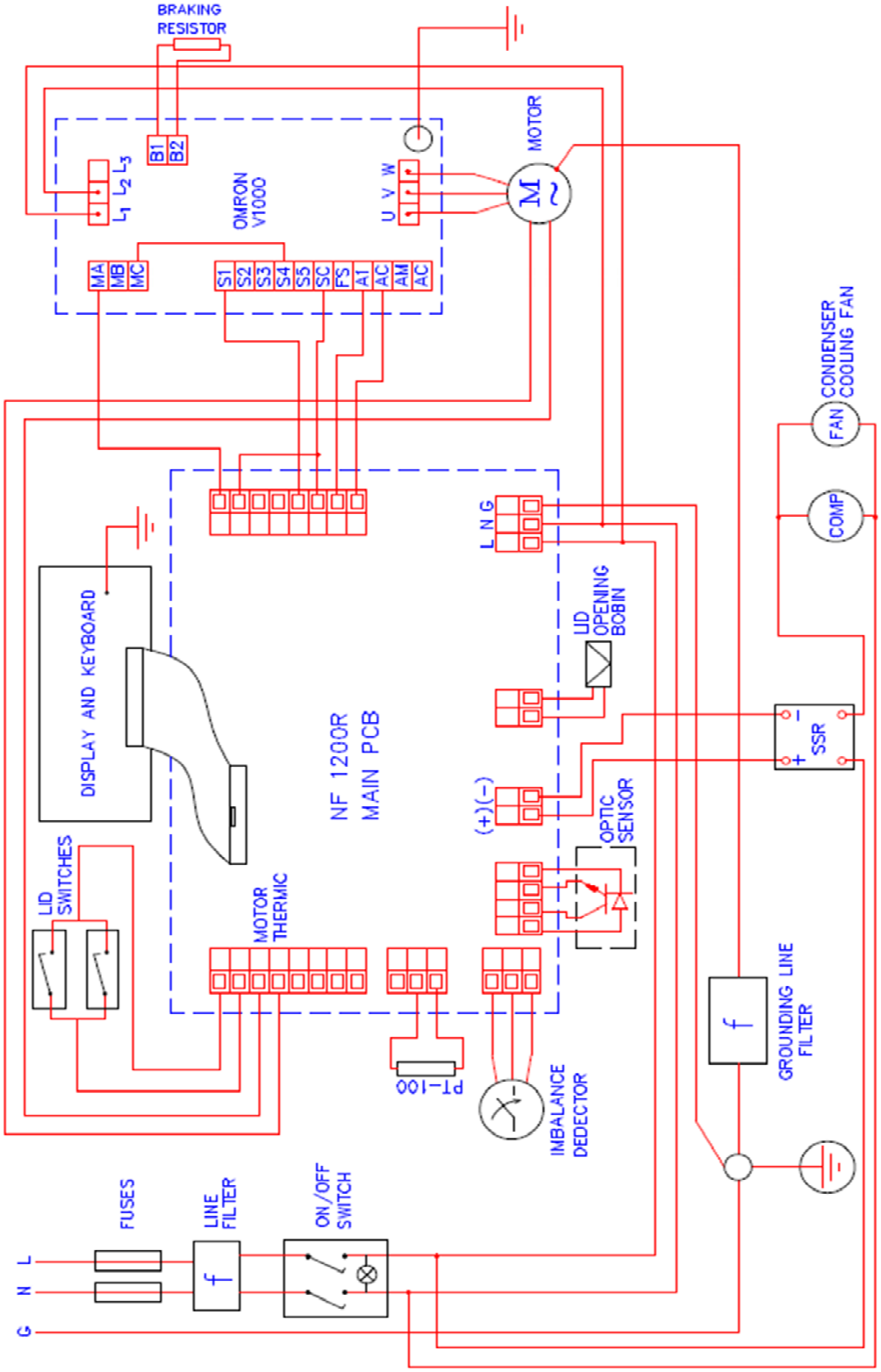
SECTION 9

ELECTRICAL CIRCUIT DIAGRAMS

9.1. ELECTRICAL CIRCUIT DIAGRAM OF NF 1200



9.2. ELECTRICAL CIRCUIT DIAGRAM OF NF 1200R



SECTION 10

WARNING LABEL

WARNING!
Please load capillary tubes at opposite locations
in the rotor and be sure that they are balanced properly.
DİKKAT!
Lütfen karşı ağırlıkları cam tüplerle
birlikte dengeleyiniz.

GROUNDED PLUG

NF 1200R
FUSES (2x10A)

NF 1200
FUSES (2x4A)